WE CLAIM:

1. A method for controlling an engine coupled to an emission control device, the method comprising:

determining a set-point location inside said emission control device;

moving said set-point location along the length of the device based on an operating condition;

determining a set-point amount of oxidant stored in the device at said moved location;

calculating an actual amount of oxidant stored in the device; and,

adjusting a fuel injection amount based at least on both said set-point amount and said actual amount of oxidant.

2. The method recited in claim 1 wherein said set point amount is determined based on said moved location.

3. The method recited in claim 1 wherein said actual amount of oxidant stored is based on an engine shutdown condition.

4. The method recited in claim 1 further comprising suspending said fuel injection adjustment based on said moved location during specified conditions.

5. The method recited in claim 1 wherein said actual amount of oxidant is determined for each brick in said emission control device.

6. The method recited in claim 1 further comprising feedback from an air-fuel ratio sensor used to update said determination of actual amount of oxidant stored.

7. The method recited in claim 1 wherein said emission control device includes multiple catalysts.

8. The method recited in claim 1 wherein said emission control device includes multiple bricks in a catalyst.

9. The method recited in claim 6 wherein said feedback includes updating said actual amount of oxidants stored based on said sensor wherein said sensor is located downstream of said emission control device.

10. The method recited in claim 1 wherein said set-point is moved within a brick in a catalyst within the emission control device.

11. The method recited in claim 1 wherein said set-point is moved based on at least a first and second temperature of different bricks within said emission control device.

12. The method recited in claim 1 wherein said set-point is moved based on the determination of differences in deterioration in different bricks in the emission control device.

13. The method recited in claim 1 wherein said adjusting said fuel injection maintains at least some reserve oxidant storage capacity behind said moved location.

14. A system for use with an internal combustion engine, comprising:

an exhaust system having multiple catalysts; and,

a controller for determining a set-point location in said exhaust system, and moving said set-point location along said catalysts within said exhaust system based on an operating condition, and adjusting a fuel injection amount into the engine based on said moved set-point location.

15. The system recited in claim 14 wherein said controller further adjusts said fuel injection amount based on a set-point amount of oxidants stored in the exhaust system at said moved location and an actual amount of oxidants stored in the exhaust system at said moved location.

16. The system recited in claim 15 wherein said set-point amount is determined based on said moved location.

17. The system recited in claim 15 wherein said actual amount of oxidant stored is based on an engine shutdown condition.

18. The system recited in claim 14 wherein said controller further suspends said fuel injection adjustment based on said moved location during specified conditions.

19. The system recited in claim 15 wherein said actual amount of oxidants is determined for specified bricks in said catalysts.

20. The system recited in claim 19 further comprising an air-fuel ratio sensor, wherein said controller further includes feedback from said sensor to update said determination of said actual amount of oxidant stored.

21. The system recited in claim 14 wherein said emission control device includes multiple bricks in said catalysts.

22. The system recited in claim 14 wherein said controller moves said set-point based on at least a first and second temperature of different bricks within said emission control device.

23. A system for use with an internal combustion engine, comprising:

an exhaust system having multiple catalysts;

an air-fuel sensor located in said exhaust system providing a signal; and,

a controller for receiving said signal, determining a set-point location in said exhaust system, and moving said set-point location along said catalysts within said exhaust system based on an operating condition, determining a set-point amount of oxidant stored in the device at said moved location, and adjusting a fuel injection amount into the engine based on said moved set-point location and said set-point amount of oxidant.

24. The system recited in claim 23, wherein said controller further adjusts said fuel injection amount based on said signal from said sensor.

25. A system for use with an internal combustion engine, comprising:

an exhaust system having multiple catalysts;

an air-fuel sensor located in said exhaust system providing a signal; and,

a controller for receiving said signal, determining a set-point location in said exhaust system, and moving said set-point location along said catalysts within said exhaust system based on an operating condition, determining a set-point amount of oxidant stored in the device at said moved location based on storage capacity of said exhaust system, and adjusting a fuel injection amount into the engine based on said moved set-point location and said set-point amount of oxidant.

26. A system for use with an internal combustion engine, comprising:

an exhaust system having multiple catalysts; and,

a controller for determining a set-point location in said exhaust system, and moving said set-point location along said catalysts within said exhaust system based on an operating condition, determining a set-point amount of oxidant stored in the device at said moved location, modulating said set-point amount, and adjusting a fuel injection amount into the engine based on said moved set-point location and said modulated amount.

27. A method for controlling an engine coupled to an emission control device, the method comprising:

determining a set-point location inside said emission control device;

moving said set-point location along the length of the device based on an operating condition;

determining a set-point amount of oxidant stored in the device at said moved location and modulating said set-point amount;

calculating an actual amount of oxygen stored in the device; and,

adjusting a fuel injection amount based at least on both said modulated set-point amount and said actual amount of oxidant.